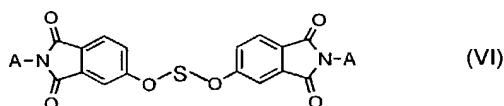
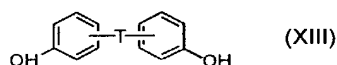


## Claims

- [c1] 1.A method for the synthesis of an activated bisimide, comprising  
 reacting 4-halotetrahydrophthalic anhydride with a primary amine having the  
 formula  $A-NH_2$  to yield an N-substituted-4-halotetrahydrophthalimide wherein  
 A is a group which activates the tetrahydrophthalimide ring system to  
 aromatization;  
 aromatizing activated 4-halotetrahydrophthalimide in the presence of a catalyst  
 to yield an activated 4-halophthalimide; and  
 treating activated 4-halophthalimide (V) with a disodium salt of a dihydroxy  
 compound having the structure  $HO-S-OH$ , to yield the activated bisimide (VI):



- [c2] 2.The method of claim 1, wherein S is selected from the group consisting of a  
 straight or branched chain alkylene group having from about 2 to about 20  
 carbon atoms, a cycloalkylene group having from about 3 to about 20 carbon  
 atoms, an arylene group having from 6 to about 20 carbon atoms, halogenated  
 derivatives of arylene groups having from about 6 to 20 carbons.
- [c3] 3.The method of claim 1, wherein the dihydroxy compound is a bis(phenol)  
 having the formula (XIII):

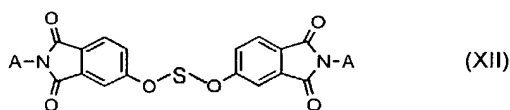


wherein T is selected from the group consisting of a single bond linking the two  
 aryl groups, a straight or branched chain alkylene group having from about 2 to  
 about 20 carbon atoms, a cycloalkylene group having from about 3 to about 20  
 carbon atoms; an arylene group having from 6 to about 20 carbon atoms,  
 sulfide, carbonyl, sulfoxide, ether and mixtures thereof.

- [c4] 4.The method of claim 3, wherein T is selected from the group consisting of  
 2,2-bis[4-hydroxyphenyl]propane; 4,4'-bis(4-hydroxyphenyl)diphenyl ether;  
 4,4'-bis(4-phenoxy)diphenyl sulfide; 4,4'-bis(4-hydroxyphenyl)benzophenone;  
 4,4'-bis(4-hydroxyphenyl)diphenyl sulfone; 2,2-bis[4-(3-hydroxyphenyl)  
 phenyl]propane; 4,4'-bis(3-hydroxyphenyl)diphenyl ether; 4,4'-bis(3-  
 hydroxyphenyl)diphenyl sulfide; 4,4'-bis(3-hydroxyphenyl)benzophenone; 4,4'-

bis(3-hydroxyphenyl)diphenyl sulfone; 4-(3-hydroxyphenyl)-4'-(4-hydroxyphenyl)diphenyl-2,2-propane; 4-(3-hydroxyphenyl)-4'-(4-hydroxyphenyl)diphenyl ether; 4-(3-hydroxyphenyl)-4'-(4-hydroxyphenyl)diphenyl sulfide; 4-(3-hydroxyphenyl)-4'-(4-hydroxyphenyl)benzophenone, and 4-(hydroxyphenyl)-4'-(4-hydroxyphenyl)diphenyl sulfone dianhydride, and mixtures thereof.

- [c5] 5.The method of claim 3, wherein the dihydroxy compound is bisphenol A.
- [c6] 6.The method of claim 1, wherein A is selected from the group consisting of pyridine, chloropyridine, nitropyridine, pyrimidine, pyrazine, thiazole, methylthiazole, benzothiazole, 1,3,4-thiadiazole, and benzotriflouride.
- [c7] 7.The method of Claim 1, wherein A is 2-pyridyl.
- [c8] 8.The method of claim 1, wherein the catalyst is copper based.
- [c9] 9.The method of claim 8, wherein the catalyst further comprises activated carbon.
- [c10] 10.A method for the synthesis of poly(etherimide)s, comprising reacting 4-halotetrahydrophthalic anhydride with a primary amine having the formula  $A-NH_2$  to yield an N-substituted-4-halotetrahydrophthalimide wherein A is a group which activates the tetrahydrophthalimide ring system to aromatization; aromatizing N-substituted-4-halotetrahydrophthalimide in the presence of a catalyst to yield an N-substituted-4-halophthalimide; and treating N-substituted-4-halophthalimide with a disodium salt of a dihydroxy compound having the structure  $HO-S-OH$ , to yield the activated bisimide (VI); and

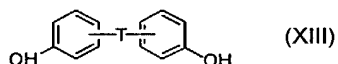


reacting activated bisimide (XII) with a diamine to form a poly(etherimide) and the primary alnine.

- [c11] 11.The method of claim 10, wherein S is selected from the group consisting of a

straight or branched chain alkylene group having from about 2 to about 20 carbon atoms, a cycloalkylene group having from about 3 to about 20 carbon atoms, an arylene group having from 6 to about 20 carbon atoms, halogenated derivatives of arylene groups having from about 6 to 20 carbons.

- [c12] 12.The method of claim 11, wherein the dihydroxy compound is a bis(phenol) having the formula (XIII):



wherein T is selected from the group consisting of a single bond linking the two aryl groups, a straight or branched chain alkylene group having from about 2 to about 20 carbon atoms, a cycloalkylene group having from about 3 to about 20 carbon atoms; an arylene group having from 6 to about 20 carbon atoms, sulfide, carbonyl, sulfoxide, ether and mixtures thereof.

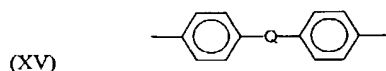
- [c13] 13.The method of claim 12, wherein the T is selected from the group consisting of 2,2-bis[4-hydroxyphenyl]propane; 4,4'-bis(4-hydroxyphenyl)diphenyl ether; 4,4'-bis(4-phenoxy)diphenyl sulfide; 4,4'-bis(4-hydroxyphenyl)benzophenone; 4,4'-bis(4-hydroxyphenyl)diphenyl sulfone; 2,2-bis[4-(3-hydroxyphenyl)phenyl]propane; 4,4'-bis(3-hydroxyphenyl)diphenyl ether; 4,4'-bis(3-hydroxyphenyl)diphenyl sulfide; 4,4'-bis(3-hydroxyphenyl)benzophenone; 4,4'-bis(3-hydroxyphenyl)diphenyl sulfone; 4-(3-hydroxyphenyl)-4'-(4-hydroxyphenyl)diphenyl-2,2-propane; 4-(3-hydroxyphenyl)-4'-(4-hydroxyphenyl)diphenyl ether; 4-(3-hydroxyphenyl)-4'-(4-hydroxyphenyl)diphenyl sulfide; 4-(3-hydroxyphenyl)-4'-(4-hydroxyphenyl)benzophenone, and 4-(hydroxyphenyl)-4'-(4-hydroxyphenyl)diphenyl sulfone dianhydride, and mixtures thereof.

- [c14] 14.The method of claim 10, wherein A is selected from the group consisting of pyridine, chloropyridine, nitropyridine, pyrimidine, pyrazine, thiazole, methylthiazole, benzothiazole, 1,3,4-thiadiazole, and benzotrifluoride.

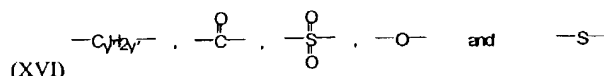
- [c15] 15.The method of Claim 10, wherein A is 2-pyridyl.

- [c16] 16.The method of claim 10, wherein the diamine has the structure  $H_2N-Z-NH_2$ , wherein Z is selected from the group consisting of a straight or branched

chain alkylene group having from about 2 to about 20 carbon atoms, a cycloalkylene group having from about 3 to about 20 carbon atoms, an arylene group having from 6 to about 20 carbon atoms, halogenated derivatives of an arylene group having from 6 to about 20 carbon atoms, and diarylene radicals of the following general formula (XV):



wherein Q includes, but is not limited to, the formula (XVI):



wherein y is an integer from about 1 to about 5, methylene, ethylene, propylene, isopropylene, n-butylene, 1,3-phenylene, naphthylene, and mixtures thereof.

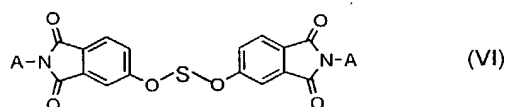
[c1 7] 17.The method of claim 10, wherein the catalyst is copper based.

[c1 8] 18.The method of claim 17, wherein the catalyst further comprises activated carbon.

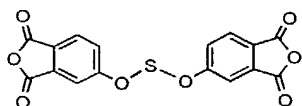
[c19] 19.The method of claim 10 further comprising recycling the primary amine.

[c20]

20.A method for the synthesis of poly(etherimide)s, comprising reacting 4-halotetrahydrophthalic anhydride with a primary amine having the formula  $A-NH_2$  to yield an N-substituted-4-halotetrahydrophthalimide wherein A is a group which activates the tetrahydrophthalimide ring system to aromatization; aromatizing the N-substituted-4-halotetrahydrophthalimide in the presence of a catalyst to yield an N-substituted-4-halophthalimide; and treating N-substituted-4-halophthalimide with a disodium salt of a dihydroxy compound having the structure  $HO-S-OH$ , to yield the activated bisimide (VI); and



converting the activated bisimide (VI) to dianhydride (VIII)

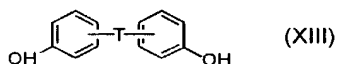


(VIII)

and reacting dianhydride (VIII) with a diamine to yield a poly(etherimide).

[c21] 21. The method of claim 20, wherein S is selected from the group consisting of a straight or branched chain alkylene group having from about 2 to about 20 carbon atoms, a cycloalkylene group having from about 3 to about 20 carbon atoms, an arylene group having from 6 to about 20 carbon atoms, halogenated derivatives of arylene groups having from about 6 to 20 carbons.

[c22] 22. The method of claim 20, wherein the dihydroxy compound is a bis(phenol) having the formula (XIII):



(XIII)

wherein T is selected from the group consisting of a single bond linking the two aryl groups, a straight or branched chain alkylene group having from about 2 to about 20 carbon atoms, a cycloalkylene group having from about 3 to about 20 carbon atoms; an arylene group having from 6 to about 20 carbon atoms, sulfide, carbonyl, sulfoxide, ether and mixtures thereof.

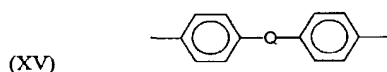
[c23] 23. The method of claim 22, wherein T is selected from the group consisting of 2,2-bis[4-hydroxyphenyl]propane; 4,4'-bis(4-hydroxyphenyl)diphenyl ether; 4,4'-bis(4-phenoxy)diphenyl sulfide; 4,4'-bis(4-hydroxyphenyl)benzophenone; 4,4'-bis(4-hydroxyphenyl)diphenyl sulfone; 2,2-bis[4-(3-hydroxyphenyl)phenyl]propane; 4,4'-bis(3-hydroxyphenyl)diphenyl ether; 4,4'-bis(3-hydroxyphenyl)diphenyl sulfide; 4,4'-bis(3-hydroxyphenyl)benzophenone; 4,4'-bis(3-hydroxyphenyl)diphenyl sulfone; 4-(3-hydroxyphenyl)-4'-(4-hydroxyphenyl)diphenyl-2,2-propane; 4-(3-hydroxyphenyl)-4'-(4-hydroxyphenyl)diphenyl ether; 4-(3-hydroxyphenyl)-4'-(4-hydroxyphenyl)diphenyl sulfide; 4-(3-hydroxyphenyl)-4'-(4-hydroxyphenyl)benzophenone, and 4-(hydroxyphenyl)-4'-(4-hydroxyphenyl)diphenyl sulfone dianhydride, and mixtures thereof.

[c24] 24. The method of claim 20, wherein A is selected from the group consisting of pyridine, chloropyridine, nitropyridine, pyrimidine, pyrazine, thiazole,

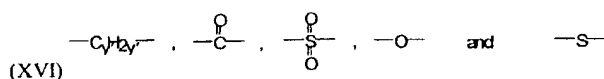
methylthiazole, benzothiazole, 1,3,4-thiadiazole, and benzotrifluoride.

[c25] 25.The method of Claim 20, wherein A is 2-pyridyl.

[c26] 26.The method of claim 20, wherein the diamine has the structure  $H_2N-Z-NH_2$ , wherein Z is selected from the group consisting of a straight or branched chain alkylene group having from about 2 to about 20 carbon atoms, a cycloalkylene group having from about 3 to about 20 carbon atoms, an arylene group having from 6 to about 20 carbon atoms, halogenated derivatives of an arylene group having from 6 to about 20 carbon atoms, and diarylene radicals of the following general formula (XV):



wherein Q includes, but is not limited to, the formula (XVI):



wherein  $\gamma$  is an integer from about 1 to about 5, methylene, ethylene, propylene, isopropylene, n-butylene, 1,3-phenylene, naphthylene, and mixtures thereof.

[c27] 27.The method of Claim 20, wherein the activated bisimide (VI) is converted to dianhydride (VIII) by reacting the activated bisimide with phthalic anhydride.

[c28] 28.The method of Claim 20, wherein the activated bisimide (VI) is converted to dianhydride (VIII) by hydrolysis ring closure.

[c29] 29.The method of claim 20, wherein the catalyst is copper based.

[c30] 30. The method of claim 29, wherein the catalyst further comprises activated carbon.

[c31] 31.A method for the synthesis of poly(etherimide)s, comprising reacting 4-halotetrahydrophthalic anhydride with a primary amine having the formula  $A-NH_2$  to yield an N-substituted-4-halotetrahydrophthalimide wherein A is a group which activates the tetrahydrophthalimide ring system to aromatization;

O=C1C(=O)N(ZN2C(=O)c3cc(X)ccc3C2=O)c4cc(X)ccc14 (IX)

[c32] 32.The method of claim 31, wherein the catalyst is copper based.

[c34] 34. The method of claim 31, wherein A is selected from the group consisting of pyridine, chloropyridine, nitropyridine, pyrimidine, pyrazine, thiazole, methylthiazole, benzothiazole, 1,3,4-thiadiazole, and benzotrifluoride.

[c36] 36. The method of claim 31, wherein the dihydroxy compound is bisphenol A.

[c38] 38. The method of claim 37, wherein the catalyst is copper based.

[c40] 40.The method of claim 37, wherein A is selected from the group consisting of

pyridine, chloropyridine, nitropyridine, pyrimidine, pyrazine, thiazole, methylthiazole, benzothiazole, 1,3,4-thiadiazole, and benzotrifluoride.

[c41] 41. The method of claim 40, wherein A is 2-pyridyl.